Listing of Claims:

This listing of claims will replace all prior versions of claims in this application.

1. (Currently amended) A method of ~~compressing mass spectrometry data~~ performing mass spectrometric analysis, comprising the steps of:

(a) mass analyzing ions in a mass spectrometer to generate data corresponding to a spectrum, and reading the data in a processor ~~corresponding to a spectrum~~;

(b) carrying out a statistical analysis of noise within the read data to obtain at least one statistical moment or parameter related to the distribution of the noise;

(c) determining a threshold value from the at least one obtained statistical moment or parameter;

(d) identifying peaks in the spectrum by comparison of the data points in the spectrum to the threshold value; and

(e) storing information related to the identified peaks along with the at least one obtained statistical moment or parameters.

2. (Previously presented) The method of claim 1, wherein the step of storing the information related to the identified peak comprises storing the data points of the peaks and discarding the noise data.

3. (Previously presented) The method of claim 1, further comprising generating a mass spectrum subsequent to the step (e) of storage.

4. (Original) The method of claim 3, further comprising displaying the mass spectrum.

5. (Original) The method of claim 4, wherein the step of displaying comprises displaying only the identified peaks without also displaying the noise in the read data.

6. (Previously presented) The method of claim 3, further comprising, after the step of storage, reconstructing the noise data based upon one or more of the stored statistical moments or parameters.

7. (Previously presented) The method of claim 6, wherein the step of generating the mass spectrum comprises generating a mass spectrum which includes both peak data and noise data, by combining the stored peak data with the reconstructed noise data.

8. (Previously presented) The method of claim 1, wherein the at least one statistical moment or parameter is selected from the list comprising an expectation value, a standard deviation, and a variance.

9. (Previously presented) The method of claim 8, wherein the threshold is EN+x*DN, where EN is the expectation value and DN is the standard deviation, and wherein x is a multiplication factor.

10. (Original) The method of claim 9, wherein x is about 2.5.

11. (Previously presented) The method of claim 1, wherein the mass spectral data is FTMS data, wherein the noise in the read data is Weibull-distributed, and wherein step (b) of statistically analysing comprises identifying at least one statistical moment of the read data which best fits that Weibull distribution.

12. (Previously presented) The method of claim 1, wherein the mass spectrometric data is time of flight mass spectrometer (TOF MS) data, wherein the noise in the read data is Poisson-distributed, and wherein the step (b) of statistical analysis comprises identifying at least one statistical moment of the read data which best fits that Poisson distribution.

13. (Previously presented) The method of claim 1, wherein the step (b) of carrying out a statistical analysis of the noise comprises:

(f) obtaining a best fit of the read data to a predetermined distribution;

(g) determining, from that best fit, at least one preliminary statistical moment;

(h) generating a preliminary threshold based on the at least one preliminary statistical moment;

(j) removing from the read data, all data points above that preliminary threshold; and

(k) re-calculating a best fit of that truncated read data to a predetermined distribution so as to obtain the said at least one statistical moment or parameter related to that noise in step (b).

14. (Previously presented) The method of claim 13, further comprising:

recursively repeating the step (j) of removing read data above a previously determined threshold, and recursively repeating the step (f) of obtaining a best fit, this time of the further truncated data to a predetermined distribution, so as to cause convergence of the at least one statistical moment.

15. (Previously presented) A method according to claim 1, further comprising the step of determining the position of magnitude of the centre of any identified peaks, and wherein step (e) comprises storing any centre positions and magnitudes.

16. (Previously presented) A method according to claim 1, wherein step (d) comprises identifying peaks by recognising strings of three or more consecutive data points greater than the threshold.

17. (Previously presented) A method according to claim 1, further comprising the steps of determining the positions of two or more identified peaks, comparing the positions to determine whether they are part of any predetermined isotopic sequence and, if they are, storing data points at positions corresponding to other expected peaks within the isotopic sequence.

18. (Previously presented) A method according to claim 1, further comprising the steps of determining the position of any unidentified peaks, comparing any peaks to determine any matches to predetermined parent/fragment molecular masses and, if any matches are found, storing data points corresponding to other expected peaks within the parent/fragment group.

19. (Currently amended) A method of ~~compressing~~ performing mass spectrometric analysis ~~data~~, comprising the steps of:

(a) mass analyzing ions in a mass spectrometer to generate data corresponding to a spectrum, and reading data ~~corresponding to a spectrum~~ in a processor;

(b) dividing the received data into at least two blocks;

(c) carrying out a statistical analysis on a first of the at least two blocks, of noise within read data within that block, to obtain at least one statistical moment or parameter relating to the distribution of the noise in that block;

(d) determining a threshold value from the at least one statistical moment or parameters obtained in respect of the noise within that block;

(e) identifying peaks in that block of the spectrum, by comparison of the data points in that block of the spectrum to the threshold value determined for that block; and

(f) storing information related to the identified peaks in that block, along with the obtained at least one statistical moment or parameter for that block.

20. (Previously presented) The method of claim 19, further comprising repeating steps (c) to (f) for at least one further block.

21. (Previously presented) The method of claim 20, further comprising identifying, from the plurality of blocks, a preferred block upon which the steps (c) to (e), or (c) to (f), are first to be carried out.

22. (Original) The method of claim 21, wherein the step of identifying a preferred block is based upon the relative likelihood of data in a particular block having a small number of peaks in it.

23. (Previously presented) The method of claim 19, wherein the step (c) comprises:

obtaining a best fit of the read data for that block to a predetermined distribution;

determining, from that best fit, at least one preliminary statistical moment for that block;

generating a preliminary threshold, based on the at least one preliminary statistical moment for that block;

removing, from the read data for that block, all data points above that preliminary threshold; and

re-calculating a best fit of that truncated read data to a predetermined distribution, for that block, so as to obtain the at least one statistical moment or parameter related to that noise in step (c) for that block.

24. (Previously presented) The method of claim 23, further comprising recursively repeating the step of removing data above a previously determined threshold for a particular block, and best fitting the further truncated data to a predetermined distribution, so as to cause convergence of the at least one statistical moment for that block.

25. (Previously presented) The method of claim 23 further comprising repeating steps (c) to (f) for a next block, and wherein the step (c) further comprises, for that next block, removing, from the read data for that next block, all data points above the threshold determined for the previous block; and

re-calculating a best fit of the truncated read data in that next block to a predetermined distribution, so as to obtain a further statistical moment or moments for that next block.

26. (Cancelled)

27. (Cancelled)

28. (Cancelled)

29. (Cancelled)